AIR MINISTRY.

DEPARTMENT OF THE CONTROLLER-GENERAL OF CIVIL AVIATION.

HALF-YEARLY REPORT

ON THE

PROGRESS OF CIVIL AVIATION.

(October 1st, 1919—March 31st, 1920.)

Presented to Parliament by Command of His Majesty.

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AIR MINISTRY.

DEPARTMENT OF THE CONTROLLER GENERAL OF CIVIL AVIATION.

Half-yearly Report on the Progress of Civil Aviation.

(*October* 1*st*, 1919—*March* 31*st*, 1920.)

INTRODUCTION.

The first half-yearly report on the development of Civil Aviation up to October 31st, 1919, was issued in two parts—a "Synopsis of Progress of Work in the Department of Civil Aviation,"* and a "Synopsis of the Progress of Civil Aviation in Foreign Countries."†

It would in future seem desirable to combine these two subjects in one Report entitled the "Progress of Civil Aviation," so that comparison may more easily be made between the developments which have taken place in different countries, and information with regard to the subject as a whole may be available in a more compact form.

Although the general structure of the previous synopses has been retained, certain modifications have been adopted in order to include, in addition to an outline of the work of the Department of Civil Aviation, information on the air services to the Continent and the important developments which are taking place in India and the Dominions. In these directions considerable results have been achieved, and it is hoped that, now the preliminary stages of organization at home and in other parts of the Empire have been accomplished, next year will see an extension of commercial enterprise and the development of Imperial air policy.

PART I.—GENERAL AND BRITISH EMPIRE.

RELATIONS WITH FOREIGN COUNTRIES.—The expansion of commercial aviation is to a great extent dependent upon the unrestricted intercourse by air between different countries, and it is therefore satisfactory to record that the International Air Convention has been signed by all the Allied and Associated Powers with the exception of the ‡United States of America and Japan.

Discussions are still taking place with late neutral States with regard to their adhesion to the Convention, and no efforts have been spared to solve the difficulties involved in their adoption of certain of its articles, especially Article 5. A Protocol has accordingly been drawn up allowing signatory States to derogate with regard to the conditions of this Article (*vide* page 14).

As a temporary measure, an agreement was negotiated on November 6th, 1919, between representatives of the Air Ministry and Swiss representatives, and air communication between the two countries was declared open on March 1st, 1920. An agreement with Holland is also in existence.

AIR NAVIGATION REGULATIONS.—The Air Navigation Bill necessary to make operative the International Air Convention will be presented to Parliament this Session.§ By an important provision in this Bill county and municipal authorities are enabled to acquire and manage aerodromes.

The existing Regulations, which came into force on May 1st, 1919, corresponded closely to the provisions of the Convention, but in order to secure conformity with

* "Synopsis of Progress of Work in the Department of Civil Aviation"; 1st May 1919 to 31st October 1919" (Cmd. 418) (H.M. Stationery Office, 2*d*.).

† "Synopsis of Progress of Civil Aviation in Foreign Countries; up to 31st October 1919" (Cmd. 476) (H.M. Stationery Office, 1*d*.).

‡ The United States signed the International Air Convention on May 31st with certain reservations. Japan has also now signed.

§ The Bill was introduced in the House of Lords on May 4th, 1920.

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that document a number of alterations and additions have been found necessary. They have been redrafted accordingly, and will be issued by Order in Council when the new Bill becomes law, though the difierences between these and the existing Regulations will not be such as seriously to affect the aviation industry.

Advantage will be taken of this opportunity to modify those details in the existing Regulations which experience has shown to be defective, and to incorporate in the new Regulations such alterations as have been effected during the past twelve months.

These alterations may be summed up as follows:—

Prohibited Areas.—The number of these has been largely reduced and partial prohibition—restricting the height at which flying over these areas may take place—has been substituted for complete prohibition.

Customs Examination.—All aircraft—and not solely those carrying goods or passengers—are now required to obtain Customs clearance before leaving the United Kingdom.

Fixed Balloons.—The special restrictions in regard to these are now only applied at localities within five miles of an aerodrome.

Parachutes.—The safety regulations affecting the dropping of articles from the air have been amended to permit of packages being dropped by parachute under certain conditions.

In addition to the incorporation of these modifications the new regulations include clauses to regulate aerial lighthouses and prevent confusion with neighbouring lights when night flying develops, and to provide for pilots' log-books. The obligation of possessing a certificate of airworthiness will also be extended to all except experimental aircraft. Separate regulations will be issued in regard to the investigation of accidents.

The crystallisation of the detailed procedure for administering the regulations has continued satisfactorily, and with the assistance of the Industry the work of laying down a sound technical basis for the regulations concerning the safety of aircraft has attained a considerable measure of success. A definite step forward has been gained as a result of the recommendations of a Sub-Committee of the Advisory Committee for Aeronautics appointed to report as to the load factors to be used in the design of civil aircraft, and agreement has been reached on the tests to be undergone by engines for use in civil aircraft. It is anticipated that the Report on Load Factors and the Schedule of Engine Tests will not only prove of value to those concerned in Great Britain and the Dominions, but will also serve as a basis for discussion as a result of which international agreement on the subject may eventually be secured.

Arrangements have been made with a view to simplifying the procedure for the attendance of the members of the crew of an aircraft for the purpose of medical examination, and a pamphlet has been published detailing the methods and standards now in use for the medical examination of pilots.*

In first examinations it is necessary to secure a type of individual most likely to withstand the stress of daily flying. Re-examinations are necessary in order to ensure that the original physical condition has not dangerously deteriorated, either as a direct result of flying, or in consequence of debilitating illnesses. The special tests that have been devised to estimate flying stress and air fatigue are yielding useful and satisfactory information of the effects of civil flying upon the individual.

Since these tests require considerable technical skill, both in their application and interpretation, it has been decided that they should be carried out as far as possible by the same individual. The medical examinations are also useful in that they help to increase the confidence of the public in the efficiency of the pilot, while the confidence of the pilot in himself is materially assisted by the knowledge of his own physical fitness.

GROUND ORGANISATION.—The State has assumed the task of providing and organising key aerodromes, assisting navigation by various methods, and instituting a wireless system for the distribution of meteorological and other information. In these directions a considerable advance has been made during the past six months.

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* "The Medical Examination of Civilian Pilots, Navigators and Engineers," January 1920. C.A. Publication I. (H.M. Stationery Office, 6*d*.).

(i) *Aerodromes.* (a) *Public.*—Hounslow, the original London terminal aerodrome, which is again required by the War Office as a cavalry training ground, has been relinquished, and Croydon (Waddon) Aerodrome has now taken its place as a main terminal and customs aerodrome. The more favourable situation of Croydon, especially with regard to atmospheric conditions and road access, will, it is anticipated, render this change generally advantageous. It is intended gradually to make this aerodrome as complete and up-to-date as possible. There is an additional customs aerodrome at Lympne, which was until recently a R.A.F. aerodrome, but has now been transferred to the control of the Department of Civil Aviation.

Both these aerodromes have civilian staffs working directly under the Controller-General of Civil Aviation and charged with the duty of maintaining the aerodromes and assisting those using them. At present the personnel is as follows:—

Croydon—
2 Civil Aviation Transport Officers.
1 Cashier.
Staff of 49 (including Wireless and Meteorological Services).

Lympne—
1 Civil Aviation Transport Officer.
1 Stores Officer.
1 Cashier.
Staff of 27 (including Wireless and Meteorological Services).

Numerous sites for Emergency Landing Grounds throughout the country have been inspected and 114 have been found suitable. Inquiries are in progress to ascertain whether tenants are prepared to conclude agreements permitting the use of their land for this purpose.

(b) *Private.*—With the expansion of commercial aviation, the extension of customs facilities to private aerodromes will become necessary. At present the only private aerodrome where these are available is that operated by Messrs. Handley Page & Co. at Cricklewood, where, by an arrangement made with the Board of Customs and Excise, a customs official has been located at the aerodrome to deal with foreign traffic.

(c) *Seaplane Stations.*—In view of the anticipated development of the seaplane and flying boat for commercial use, especially for traffic across the North Sea, arrangements have been made to take over one slipway, office accommodation and a number of mooring buoys and sheds at the permanent R.A.F. Seaplane Station at Felixstowe.

(d) *River Stations.*—Considerable loss of time is entailed in transit to and from aerodromes which are at present necessarily situated some miles outside large towns. Where a river passes through a town, this waste of time can be obviated by the provision for seaplanes of an alighting area on the river as near the centre of the town as possible. A scheme drawn up after careful investigation for the utilisation of certain stretches of the Thames in the London Area by this type of aircraft is now being discussed by the various Government and municipal authorities concerned.

(ii) *Navigation.*—A considerable amount of work has been done in assisting navigation. Names have been marked on the roofs of the railway stations at Ashford, Hitchin, Redhill and Tonbridge; and a preliminary survey has been made for the purpose of marking by other inexpensive methods the names of important towns on air routes where the marking of stations is not feasible.

If full advantage is to be taken of the superior speed of aircraft over other means of transport, especially in connection with the carriage and delivery of mails between business hours, it is essential for aircraft eventually to fly both by night and day. Under war conditions a complete, simple and inconspicuous system of signalling between aircraft and the ground was essential, and a large personnel was available. For civil aviation the lighting of aerodromes should be brilliant, the signal system may be more complicated, and the use of mechanical apparatus and the reduction of personnel must be encouraged.

Experiments have accordingly been carried out at Andover on aerial lighthouses, flares and landing lights for the purpose of deciding upon the best methods of assisting navigation at night. Meanwhile, since the beginning of the year, an aerial lighthouse has been in operation at the Hounslow aerodrome from which valuable experience has been obtained. It has now been transferred to the Croydon aerodrome, which will also be equipped with night landing gear. The regulations laid down by

the International Air Convention governing the navigation lights carried by airships are being investigated.

Another important step towards facilitating navigation has been the compilation of text-books, maps and charts, including the first edition of an "Aerodrome Book," which, with its maps, will form a comprehensive guide to the situation and organisation of all aerodromes and landing grounds in the British Isles. A Gazetteer with maps of the World's aerodromes and aerial routes, and an official text-book on air navigation are also in preparation, and proposals for a standard equipment of charts for navigation by direction-finding wireless telegraph are being considered. Arrangements have been concluded with the War Office and Admiralty for all charts and maps to be executed by the Geographical Section of the General Staff.

All available information, embracing methods of navigation, the use of navigating instruments and the routes to be followed, has been collated for the assistance of pilots undertaking long-distance flights from England to India, Australia, Cape Town and various foreign countries, and from Holland to Java.

On the London–Paris route further surveys have been made for the purpose of compiling more comprehensive route directions.

(iii) *Signals.*—Improvements have been made in the installation and organisation of the Air Ministry Wireless Station, which is now called upon to deal with double the volume of meteorological and other W/T traffic that was handled in October last.

The following figures give the number of messages in connection with civil aviation received and transmitted by this station, in addition to the heavy work entailed by the R.A.F., between February 1st and March 31st, 1920, inclusive :—

Weather messages to Le Bourget - - - -	444
,, ,, from Le Bourget - - -	126
Route messages to Le Bourget - - - -	436
,, ,, from Le Bourget - - - -	314
Messages received for Meteorological Office - -	1,299
Total - - - - -	2,619

A complete W/T network for the assistance of meteorology and aviation, both service and civil, is being organised in the United Kingdom. As part of this system, W/T stations are being erected at the civil aerodromes at Croydon, Castle Bromwich, Didsbury and Renfrew.

In co-operation with the authorities concerned, arrangements have been made for the improvement of W/T communication on the civil routes between this country, France and Belgium. The transmission and receipt by wireless of Meteorological Office reports to and from other countries have been facilitated.

With regard to radio telephony, five stations in the United Kingdom have been fitted with R/T apparatus for the use of civil aircraft, and arrangements with France are near completion for the erection of R/T stations for the air services between that country and England.

It is also proposed to assist aerial navigation by means of wireless direction-finding, especially for the purpose of overcoming the difficulties presented by fog, mist and clouds, and equipment for this purpose has been installed at Croydon. Arrangements are being made for a similar system in Paris and Brussels.

A syllabus of examination for wireless operators has been drawn up in conjunction with the General Post Office, which will necessitate all W/T operators qualifying by examination for the new certificate of the Postmaster-General.

A difficult and intricate problem is that of systematising the wave-lengths in use throughout the world, but proposals have now been put forward by the Department of Civil Aviation to the Government Departmental Committee sitting at the G.P.O. for the purpose of formulating a British draft "International Radio Convention"; these proposals, which are still under consideration, while accepting the principles of the International Commission lately held in Paris, have set out a definite world-wide scheme of wave-lengths on which the future policy of world wireless would depend.

The Signals Branch of the Department is reorganising the R.A.F. wireless and land line equipment and personnel according to peace establishment, and is reducing the number of service W/T stations and land lines from a war basis to that sufficient for peace requirements.

Arrangements have been made during the last six months for the further release for public use of :—

		Total since Armistice.
Switchboards	34	210
Tie lines	20	224
Exchange lines	79	568
Telephones	969	3,518

Tables for visual signalling have been compiled and issued, and a syllabus for visual training has been published.

IMPERIAL AIR ROUTES.—Since the publication of the last report pioneer flights have been accomplished by Sir Ross Smith from England to Australia, and by Lieut.-Colonel van Ryneveld from England to Cape Town. For these flights a large amount of detailed information was collected; route directions, maps, charts, and navigational information were prepared and distributed to those taking part; and on the Cairo to Cape Town route arrangements were made for accelerating telegraphic communication. Valuable experience has been gained from these flights, especially in regard to climatic conditions, the laying out of aerodromes in the tropics, and the action of aeroplane engines under varying circumstances.

The financial responsibility for the reconnaissance of the Cairo to Cape Town route has been borne by the Department of Civil Aviation. Negotiations are now in progress between the Governments of South Africa and of the Colonies over which the route passes, the Colonial Office and the Treasury as to the future maintenance of the route.*

On the Cairo–Karachi route the wireless and land line systems have been improved; Cairo and Bushire have been connected by W/T, with intermediate stations at Ramleh, Baghdad and Basra; and the equipment of Karachi, Bandar Abbas, and Chahbar with W/T stations is now being taken in hand. There are, in addition, minor stations equipped with comparatively short-range apparatus at various places along the route.

Considerable importance attaches to the establishment of an aerodrome at Malta as a link between England and Egypt. The section of the route between St. Raphael and Pisa is not satisfactory, and an alternative line *viâ* Corsica and Sardinia to Malta, which would have the advantage of utilising one of the few British possessions in the Mediterranean, has been under consideration. A site for an aerodrome at Malta has been selected and operations have been carried out which prove that the outcrop of rock which presented the chief obstacle can be removed at a moderate cost.

METEOROLOGY.—The Headquarters of the Meteorological Office were transferred from South Kensington to the Air Ministry on November 18th, 1919, and all the Government meteorological agencies, including the Marine, Statistical, and Instruments Divisions, and the British Rainfall Organisation, are now co-ordinated under the Department of Civil Aviation, which is responsible for, and bears the cost of, the meteorological service of Great Britain, not only in regard to aviation but to the development of the science of meteorology as a whole.

Reliable weather reports are one of the prime necessities of aviation, and these are prepared by the Forecast Division, which during the period under review has devoted its labours mainly to three purposes:—

(i) The amalgamation, which has been satisfactorily completed, of the work of the Meteorological Service of the Royal Air Force with the work of the Forecast Division of the Meteorological Office. Since January the printing of the Daily Weather Report has been carried out by H.M. Stationery Office at a lithographic press on the premises, and the distribution of the Report has been arranged by the Forecast Division.

(ii) The establishment of local meteorological centres staffed with trained personnel to contribute reports essential for aviation and to specialise in

* The Government of British East Africa has agreed to assume responsibility for the maintenance of the aerodromes within its territory.

the work of short-period forecasting for small areas. This task is not yet completed, but there are eight general and three auxiliary stations in operation.

(iii) The inauguration of a complete system of British weather reports for S.E. England in connection with flying between London and the Continent on the lines laid down in Annex G of the International Air Convention.

Since December 1919, a report on the weather expected during the following day on the air routes between London, Paris and Brussels, has been issued each evening to the Press, and short-period forecasts for the London–Paris route have also been issued twice daily at 9.30 a.m. and 3 p.m.

A feature of the period has been the extension of the use of wireless telegraphy for the distribution of synoptic weather messages between different countries. Reports are now being received daily, *viâ* the W/T station of the Air Ministry, from the following countries:—Sweden, Denmark, France, Germany, Poland, Italy and Spain.

In addition to the W/T messages sent out daily from the Air Ministry, and, by arrangement with the Admiralty, from Aberdeen, synoptic messages are cabled from the Meteorological Office to Norway, Sweden, Denmark, Holland, France, Switzerland and Italy.

The answering of inquiries from the Public and the Press is a part of the work of the Forecast Service which has received special attention since the transfer of the Service to Kingsway. It has included provision for the exhibition of the current charts and of information for press correspondents and other inquirers.

An important problem, which is in process of solution, is the completion of arrangements for the issue of the full data for synoptic charts, envisaged in Annex G of the International Air Convention. This has been delayed, partly owing to the necessary preparation of very detailed instructions to the primary reporting stations, mainly staffed by coastguards; and partly owing to the need for co-ordinating the code for the reports for land and sea, which was not completed in Annex G.

The routine work of the other divisions of the Meteorological Office has been carried on without interruption. The form of the log-books and monthly charts of the Atlantic Ocean and East Indian Seas has been revised; closer co-operation has been achieved between the Statistical Division and the British Rainfall Organisation; the Instruments Division has been dealing with instruments returned from abroad; ballistic investigations have been continued at Shoeburyness; and the duties of the Rainfall Organisation since it was attached to the Meteorological Office in July 1919 have not decreased.

The scientific work at the Observatories at Richmond (Kew), Eskdalemuir, Benson, Valencia and South Farnborough, has proceeded without interruption. This includes (in addition to the usual meteorological observations) terrestrial magnetism, atmospheric electricity, with atmospheric ionisation, solar radiation and seismology. The investigation of pressure and temperature by self-registering instruments carried by free balloons to altitudes greater than can be reached by aeroplanes and airships is being continued and extended; new methods have been devised for obtaining the upper wind above a layer of fog and for measuring the outward radiation at night, a very important factor in connection with atmospheric radiation. Progress has been made with the investigation of changes of magnetic declination for different parts of the country. The relation between fog and the gradient of electric potential, and the location of distant thunderstorms by means of a special type of wireless directional apparatus, are receiving attention.

The provision of meteorological information for night flying marches hand in hand with the general development of the meteorological *réseau*. Knowledge of the upper winds will enable compass bearings for flights up to 150 miles to be set out with accuracy beforehand, and the co-ordination of the synoptic chart with the local observations of temperature and humidity will enable the Meteorological Department to provide valuable data in regard to night flying.

COMMERCIAL SERVICES.—Since November 10th, 1919,* an Air Mail Service has been in operation between this country and Paris.

* From May 12th there will be two mail services daily from London to Paris. The original fee of 2*s.* 6*d.* per ounce will be altered to 2*s.* per ounce with an additional 6*d.* if express delivery in Paris is desired.

CMD. 800 (1920)

Tenders for a similar service between England and Holland have been invited by the Postmaster-General, in conjunction with the Dutch Post Office,* and negotiations are also in progress with Belgium for the establishment of an aerial mail on the same lines. A regular service has been maintained with Brussels, and goods have been exported to Belgium by air.

Statistical tables are appended showing, for various periods, the work carried out by civil aircraft, the number of British and foreign machines departing to and arriving from the Continent, the value of the goods imported and exported by air, and the number of accidents sustained by machines and personnel.

It will be seen that the average length of flights has increased from slightly over 12 minutes in the first five months of civil aviation, *i.e.*, from May to September, 1919, to 28 minutes during the six months under review, showing that the increase is mainly in real commercial traffic rather than in the instructional and propaganda work so largely carried on during the summer. This is also borne out by the fact that although the number of machine flights made and the number of hours flown during the summer months was greatly in excess of those between October 1st and March 31st, the weight of goods carried in the second period considerably increased.

From August 26th, 1919, to March 31st, 1920, goods to the value of 209,358*l.* were carried by the Continental Services, 136,116*l.* representing Imports, and 73,242*l.* Exports. Of this, 7,644*l.* represented dutiable goods. Clothing of various descriptions formed the principal item in both Imports and Exports. Imports also included watches and cinematograph films; Exports: precious metals, cinematograph films, drugs and perfumery.

British Civil Aviation, including Continental Traffic.†

May 1*st*, 1919, *to March* 31*st*, 1920.

——	May to Sept. 5 months.	Oct. to Dec. 3 months.	Jan.	Feb.	March.	Jan. to March. 3 months.	Oct. to March. 6 months.	May to March. 11 months.
Number of machine flights made.	31,250	4,170	542	637	1,222	2,401	6,571	37,821
Number of machine hours flown.	6,566	1,852	309	333	567	1,209	3,061	9,627
Average duration of each flight in minutes.	12	26	34	31	28	30	28	15
Approximate machine mileage	460,285	137,964	21,671	26,400	45,539	93,610	231,574	691,859
Number of passengers carried	58,132	6,284	793	931	1,800	3,524	9,808	67,940
Approximate number of hours flown by passengers.	13,803	2,697	318	466	812	1,596	4,293	18,096
Weight of goods carried in lbs.	45,130	22,013	2,644	7,935	25,056	35,635	57,648	102,778

Departure and Arrival of Aircraft to and from the Continent.

——	Aug.‡ 26th–31st.		Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		Mar.		Total.	
	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.
British -	9	8	68	64	84	80	54	39	33	28	44	33	44	38	65	63	401	353
French -	—	—	6	7	15	15	8	10	2	1	4	4	7	6	24	24	66	67
Belgian -	—	—	—	—	—	—	—	—	—	—	—	—	2	3	1	1	3	4
Swiss -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	1
Other States.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total -	9	8	74	71	99	95	62	49	35	29	48	37	53	47	91	89	471	425
Total for August and September.			83	79	Total for 3 months October–December 1919.				196	173	Total for 3 months January–March 1920.				192	173		

* The conditions were published in the Press on April 20th.

† These figures, which have been supplied voluntarily by the firms concerned, do not include competition flights from England to Australia or Cairo to the Cape.

‡ August 26th, 1919, was the date upon which international civil flying first began.

Value of Goods Imported and Exported into and from the United Kingdom.

Period.	Imports (Free) from—			Imports (Dutiable) from—				Re-exports to France.	British Exports to—			
	Netherlands.	Belgium.	France.	Netherlands.	Belgium.	France.	Italy.		Netherlands.	Belgium.	France.	Italy.
	£	£	£	£	£	£	£	£	£	£	£	£
Aug. 1919	—	—	—	—	—	1	—	—	—	—	12	—
Sept. 1919	—	—	4,425	—	—	75	—	844	—	—	2,146	—
Oct. 1919	—	22	23,389	—	—	509	6	1,201	—	—	7,270	1
Nov. 1919	—	9	18,009	1	—	2,132	—	584	—	7,376	6,555	—
Dec. 1919	—	145	10,398	—	2	716	—	615	—	2,206	2,287	—
Jan. 1920	—	—	8,188	—	—	1,687	—	1,309	—	—	1,327	—
Feb. 1920	—	—	17,721	—	5	1,101	—	8,651	—	1	5,126	—
Mar. 1920	470	208	45,488	—	—	1,409	—	12,528	3,497	—	6,706*	—
	470	384	127,618	1	7	7,630	6	25,732	3,497	9,583	31,429	1
	128,472			7,644				70,242				

* In addition, diamonds to the value of 3,000*l.* were exported to France in March.

Accidents.

—	May to Sept. 1919. 5 months.	Oct. to Dec. 1919. 3 months	Jan. to March 1920. 3 months.	Oct. 1919 to March 1920. 6 months.	May 1919 to March 1920. 11 months.
Number of accidents resulting in death to one or more occupants of machine.	2	2	—	2	4
Number of non-fatal accidents resulting in injury to occupants of machine.	8	—	3	3	11
Number of accidents resulting in death of third party (occupants of machine uninjured).	1	—	—	—	1
Number of accidents in which no one was killed or injured.	2	3	3	6	8
Total accidents reported - - - -	13	5	6	11	24
Approximate number of machine miles flown per accident.	35,406	27,593	15,601	21,052	28,827
Approximate number of machine flights per accident.	2,404	834	400	597	1,576
Approximate number of machine hours flown per accident.	505	370	201	278	401
Pilots killed - - - - - - -	2	2	—	2	4
Pilots injured - - - - - - -	6	—	3	3	9
Passengers killed - - - - - -	—	1	—	1	1
Passengers injured - - - - - -	10	—	2	2	12
Third party killed - - - - - -	1	—	—	—	1
Pilots killed per 1,000 flights made by pilots	·06	·48	—	·30	·106
Pilots injured per 1,000 „ „ „ „ -	·19	—	1·23	·45	·238
Pilots killed per 1,000 hours flown by pilots	·31	1·08	—	·65	·415
Pilots injured per 1,000 „ „ „ „ -	·92	—	2·48	·98	·934
Passengers killed per 1,000 passengers carried	—	·16	—	·10	·015
Passengers injured per 1,000 „ „	·17	—	·57	·20	·176
Passengers killed per 1,000 hours flown by passengers.	—	·37	—	·23	·055
Passengers injured per 1,000 hours flown by passengers.	·72	—	1·25	·46	·663

The above figures do not include competitive flights from England to Australia or Cairo to the Cape.

Licences.—As was pointed out in the last Report, licences are required by all pilots of aircraft, while every civil machine has to be registered and numbered, and, if carrying passengers for hire or reward, must be certified as "airworthy."

During the last six months the following licences and certificates have been granted :—

		Total issued since May 1st, 1919.
Licences for pilots	163	484
„ „ „ renewals	129	129
„ „ ground engineers	113	345
„ „ engineers	1	1
„ „ navigators	3	4
„ „ aerodromes	36	119
„ „ „ renewals	12	12
Certificates of registration	127	474
„ „ airworthiness	107	325

The effect of the winter months is noticeable in these figures, though they show a definite, if small, development.

INSURANCE.—Lloyd's have decided to undertake the systematic collection of information for purposes of aviation insurance, and the information collected will be circulated to their members in a confidential record. The Department of Civil Aviation has promised to give them any assistance in their power, and has accordingly agreed to allow them to inspect and copy the register of aircraft certificates, and to give them such other information as they can, including particulars as to licences issued to pilots, standards applied in the official examination, aerodromes in the United Kingdom, &c. For information as to other matters Lloyd's propose to place themselves in touch with the owners and constructors of aircraft (particularly with a view to obtaining particulars as to aircraft after certification), and with the licensees of aerodromes. It is hoped that the interest which Lloyd's are showing in this matter will result in the establishment of a sound system of aviation insurance, based on the common requirements of all concerned, which will be of great assistance in the development of civil aviation to meet public needs.

COLLECTION, COLLATION AND ISSUE OF INFORMATION.—Information concerning the development of civil aviation and commercial opportunities for its exploitation abroad is obtained through the Air, Naval and Military Attachés in foreign countries. In addition, the diplomatic, consular and commercial machinery of the Department of Overseas Trade (Foreign Office) has assisted in the collection of information on these subjects.

Information obtained from these sources covering the following points—the establishment of new aerodromes and new aerial routes, the adoption of new conventions and regulations, the provision of W/T meteorological facilities, &c.—is issued direct to the industry or through the medium of the Society of British Aircraft Constructors, either in periodic résumés, or, if of an urgent nature, so soon as received.

Record has been kept of aviation activities at home, communiqués to the Press have been issued as required, and numerous inquiries on different aspects of civil aviation have been dealt with.

A series of "Notices to Airmen" has been instituted by which the attention of pilots and all concerned is drawn to important official instructions and information affecting civil aviation.

Since the date of the last report the following have been issued :—100 Special Notices to the Society of British Aircraft Constructors ; 6 Monthly Commercial Résumés ; 14 Technical Memoranda ; 3 Confidential Technical Memoranda ; 3 Technical Abstracts ; 185 Communiqués, and 35 Notices to Airmen.

DISPOSAL OF AIRCRAFT.—With the exception of a number of machines which have been presented under Treasury sanction to the Dominions and Colonies, the entire stock of surplus aircraft and aeronautical material has been sold by the Disposals Board to the Imperial and Foreign Corporation, who have formed a company under the name of the Aircraft Disposal Company to resell it.

AIR MINISTRY COMPETITIONS.—A committee, representative both of the Air Ministry and the aircraft industry and assisted by experts, drew up rules for

competitions with the object of furthering safety and comfort in air travel. The Society of British Aircraft Constructors put forward certain modifications in order to accentuate the factors making for commercial utility, as distinct from considerations of safety, and these have been adopted. The competitions have been fixed to take place at Martlesham Heath and Felixstowe, as follows: For large and small type aeroplanes on August 3rd, and for amphibians on September 1st.

EXPENDITURE, 1919–1920.—The sum expended by the Department of Civil Aviation during the past financial year was 119,081*l.* It should, however, be appreciated that in addition numerous liabilities have been incurred and work carried out, payment for which is provided for in the Estimates for the current financial year. The main items of expenditure may be classified as follows:—

Headquarters Staff* (including pay and allowances of officers on loan from the R.A.F.), 24,366*l.*; staff at civil aerodromes, 9,130*l.*; works and alterations at civil aerodromes, 8,118*l.*; stores obtained on repayment from R.A.F., 3,595*l.*; stores purchased from outside sources, 2,459*l.*; sundry expenses incurred in running civil aerodromes, 4,608*l.*; flights to the Continent, 9,762*l.*; preparation of the Cairo to Cape Town route (including personnel, petrol, oil, &c.), 57,043*l.*

In addition to these expenditures there are certain liabilities in connection with the Cairo to Cape Town route and the survey of the India–Australia route, the accounts for which have not yet been rendered, but which are estimated at about 5,200*l.*, bringing the total expenditure for the year up to 124,281*l.* To this may be added the free issues made to the Department from R.A.F. stocks to the value of 38,877*l.*

RESEARCH.—The Research Department and the Department of Civil Aviation have co-operated in producing, in conjunction with the manufacturers, new types of recording and measuring instruments for the Air Ministry Competitions, which according to the rules must be of British manufacture.

Progress has been made with the development of the various types of turn indicators, which are now being used to enable aircraft to fly safely in and above clouds.

The development of the R.A.E. sextant, the aperiodic compass, bearing plates and navigational flares for use at sea, facilitate the methods of checking dead reckoning for air navigation.

Attention is being paid to the design of all-metal machines.

THE DOMINIONS, INDIA, AND THE COLONIES.—In order that civil aviation may develop as an Imperial asset, arrangements are being made to secure, by an interchange of laws and regulations, the greatest possible measure of uniformity consistent with local requirements throughout the Empire, and the Air Navigation Bill provides for the adaptation by Order in Council to British Possessions, exclusive of the self-governing Dominions and India, of the legislation in force in this country. Canada and India have instituted Air Boards and published air regulations based on those in force in Great Britain, which are themselves in conformity with the International Air Convention; and the other Dominions are considering the best methods of administering civil aviation. The Colonial Office, the India Office, and, in the case of Egypt, the Foreign Office, are co-operating with the Air Ministry in effecting an interchange of views between the Dominions and Colonies and the Mother Country, towards which a step has been taken by the Dominions in appointing liaison officers to the Air Ministry.

The Governments of Australia, Newfoundland and New Zealand have approved the ratification of the International Air Convention as soon as such a course is considered advisable.

Australia.—The body which at present deals with aviation is a Committee of the Prime Minister's Office, called the "Air Services Committee." No air regulations have as yet been drawn up by the Commonwealth Government, but it is understood that the whole question of the administration of civil aviation is now under consideration.

A number of demonstration flights are being conducted by ex-members of the Royal Air Force, and a gift of one hundred aeroplanes has been accepted from the British Government.

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* The expenditure on the Headquarters Staff does not include that for the Directorate of Meteorology, which was transferred to the Air Ministry in November 1919, but which, according to the directions of the Home Affairs Committee of the Cabinet, was the subject of a separate vote until the financial year 1920–21.

*Canada.**—The Air Board Act was passed in January 1919 instituting an Air Board consisting of not less than five and not more than seven members, to be appointed by the Governor-General in Council. The functions of the Board, which has been reconstituted under the Chairmanship of the Minister of Militia and on which the Naval Service is represented, are similar to those of the Air Council in Great Britain. The Board includes a Superintendent of Flying Operations, responsible for all civil aviation undertaken by the Government, and a Superintendent of Certificates, who controls the licensing of personnel, aircraft and air harbours, and is responsible for civil aviation conducted by private enterprise.

The Associate Air Research Committee, which held its first meeting on February 7th, has been formed under the Honorary Advisory Council for Scientific and Industrial Research, and will work in close co-operation with the Air Board. The co-operation of the Meteorological Office and the General Superintendent, Government Radio-Telegraphic Service, has also been secured.

Dangerous flying was prohibited by Order in Council on July 7th, and regulations governing civil aviation, and based on the International Air Convention, were published on January 17th, 1920.

The Air Board is giving consideration to the special uses to which aircraft can be put in Canada, such as forest patrol and survey work; and authority has been obtained to carry out experiments in photo-topographical surveying in the province of Quebec.

India.—The ban on civil aviation has been removed and an Air Board has been set up under the administration of the Department of Commerce and Industry. Its functions are advisory, executive authority for carrying out its decisions being vested in the Department's Member in Council.

The Indian Aircraft Act of 1911 empowers the Governor-General in Council to make regulations governing civil aviation. In accordance with these powers, in December 1919, regulations based on those in force in Great Britain were published in draft by the Department of Commerce and Industry, and are now in operation.

New Zealand.—An Act entitled "The Aviation Act of 1919" was passed in December 1918, and empowers the Governor-General to make regulations by Order in Council as to the issue of licences to flying schools and pilots, the registration of aircraft and prohibited areas.

South Africa.—Civil aviation is temporarily under the control of the Department of Railways and Harbours, but on January 25th, 1920, a conference was held to consider the best method of controlling and developing civil aviation in South Africa, and the whole question is now under consideration by the Union Government.

The Government is fully alive to the importance of aviation and has already offered to take over the aerodromes on the Cairo to Cape Town route situated within its territory.

West Indies and Bermuda.—A strong combine of British firms is considering plans for the establishment of air services in the West Indies and Bermuda and its proposals are receiving the attention of the Colonial Governments concerned.

The legislature of the Bahamas has passed a Bill for the provisional regulation of air navigation, and the grant of concessions to a company undertaking an air mail and passenger service between the Bahamas group of islands and between those islands and Florida has been under consideration.

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* The High Commissioner for Canada signed the International Air Convention on April 13th, 1920.

PART II.—FOREIGN COUNTRIES.

General Remarks.

The International Air Convention has been signed by all the Allied and Associated Powers, with the exception of the *United States and Japan.

The main difficulty which has stood in the way of the still wider adoption of the Air Convention is contained in Article 5, which forbids the passage of aircraft belonging to non-contracting States over the territory of contracting States, and although this clause does not actually come into effect until ratifications of the Air Convention between two of the contracting States have been exchanged, neutral States have naturally hesitated to subscribe to a Convention which would effectually cut them off from Germany and other late enemy States with which throughout the war they enjoyed freedom of communication.

To meet this difficulty a †Protocol has been drawn up whereby States desirous of joining the Air Convention will be able to derogate with regard to conditions laid down in Article 5, and thus, while subscribing to the Air Convention, be able to maintain communication by air with late enemy countries until such time as the latter are allowed to become members of the League of Nations.

While Great Britain is the only country which possesses an Air Ministry comprising both service and civil departments, other States, notably France, Italy, Belgium, Spain and Switzerland, have created departments for civil aviation, which, except in the case of Belgium, have been dissociated from the Ministries of War and placed under the control of the Ministries of Public Works, Transport or Posts and Railways. Other countries, such as the Scandinavian States, have appointed special committees for considering the future administration of civil aviation.

Provisional regulations governing air navigation have been drawn up and published by France, Italy, Belgium, Spain and Switzerland. Subsidies, long distance demonstration flights, and foreign missions are among the methods used by various States to encourage civil aviation and to secure public confidence in its future.

The development of civil aviation in late enemy countries has been retarded by disturbed political conditions, the financial and economic situation, and the operation of the Peace Treaties. By the terms of these treaties the manufacture and importation of aircraft and aircraft engines and accessories is forbidden in late enemy territory for a period of six months after the ratification of peace, while all military and naval aeronautical material must be delivered up to the Allies.

Nevertheless, Germany, Austria and Hungary have created or are organising departments to deal with civil aviation—Germany possessing a Ministry of Air and Transport—while Germany and Austria have issued regulations governing air traffic.

During the last six months, the British aircraft industry has continued to make headway in foreign markets. South America has been a scene of development, and it is not unnatural that attention should have turned to this part of the globe, where the great distances between commercial centres and bad communication by road and rail, render conditions particularly well suited for the establishment of air transport.

China, Holland, Norway and Poland, have also been chosen as favourable fields for exploitation, and the activity of British firms in Spain has continued.

Europe.

Austria.—Serious consideration is being given to air transport. An Aviation Department has been constituted under the State Secretary of Transport, and provisional regulations for air navigation were issued by a Decree of December 10th, 1919. But so long as the economic situation remains as unfavourable as it is at present, it is unlikely that civil aviation will develop as rapidly as in other countries. One of the main difficulties is the shortage of petrol. The Luftfahrwesen Gesellschaft (known as "Lufag") has bought up the whole stock of service aircraft. They are being resold under the control of the Disposal Board, 60 per cent. of the excess over valuation price realised being credited to the State.

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* *See* footnote on page 3.

† The Protocol has now been signed by the United States, Belgium, Bolivia, Great Britain, Canada, Australia, South Africa, New Zealand, China, Cuba, Ecuador, France, Greece, Italy, Japan, Panama, Poland, Portugal, Rumania, the Serb-Croat-Slovene State, Siam, Czecho-Slovakia, and Uruguay.

BELGIUM.—A Department of Aviation, autonomous but temporarily attached to the Ministry of War, has been created. It is divided into four sections responsible for: (1) The organisation of air lines; (2) The exploitation of air lines; (3) General, judicial and diverse questions; (4) Aeronautical research work.

Navigation Regulations, based upon the International Air Convention, were published on November 27th, 1919.

Air Attachés have been appointed to London and Paris.

At the present time civil aviation is carried on almost entirely by, or in collaboration with, the National Syndicate for the Study of Aerial Transport, which has been formed, as forecasted in the last Synopsis, mainly by a combination of important Belgian bankers. The Syndicate has prepared a scheme for the provision of facilities on aerial routes for companies with which it has entered into agreement, is arranging to place its organisation at the service of the owners of civil aircraft at appropriate charges, and has under consideration the operation of mail and passenger services. During the month of February the receipts from passenger pleasure flying amounted to 34,000 francs, the total expenditure being approximately 20,000 francs.

The Government has placed 2,000,000 francs at the disposal of the Syndicate for the purpose of inaugurating an experimental service of hydro-aeroplanes and hydro-glisseurs in the Belgian Congo, a fact which lends weight to a report that it is prepared to grant subsidies for the encouragement of transport companies.

An International Aeronautical meeting is to be held at Antwerp in July of this year. Competitions are being arranged for hydro-aeroplanes, aeroplanes, hydro-glisseurs and balloons.

DENMARK, NORWAY, SWEDEN AND FINLAND.—Further conferences have been held between representatives of the Scandinavian States and Finland with the object of examining the terms of the International Air Convention, and discussing the most suitable form of air legislation.

The first official conference was held in June 1919, when an air code for these States was discussed. Since that date the conference has assembled at Stockholm in November 1919, and at Copenhagen in January 1920. The recommendations with regard to adherence to the International Air Convention reached at the last of these conferences, are now under consideration by the Governments of the respective countries.

Denmark and Norway have appointed commissions under the Ministers of Public Works and War respectively for the study of air transport and kindred subjects. In Sweden, legislation on civil aviation is effected through the Ministry of the Interior.

In Denmark the Aeronautical Commission considers that the institution of a civil Air Department would at present be premature, but it has accepted a scheme for the future organisation of civil aviation under the Ministry of Public Works, which will control flying by means similar to those provided by the British Air Navigation Regulations. It is also proposed to form a State Aviation Board to deal with technical questions, to control flying schools, and also, if desired, to assist the naval and military aviation services.

The Commission further recommends the early acquirement, on the coast near Copenhagen, of a suitable site for a combined aerodrome and hydroplane base, the existing accommodation at the naval and military stations being inadequate for the proposed civil service.

Meetings of north European air transport companies have also taken place in Denmark for the discussion of matters relating to international air communication services.

An air transport insurance pool representing a combine of some 80 Danish, Norwegian, Swedish, and Finnish insurance companies has been formed. Under its auspices the registration and classification of aircraft and pilots has commenced throughout the Scandinavian States.

The air transport companies in these countries have been active in preparing schemes for aerial routes, but as the operation of these routes has generally depended on State grants which have not been forthcoming no regular services have yet been established. Swedish and Finnish companies recently combined to inaugurate a service between Stockholm and Helsingfors, which it is hoped will commence in May or June next. An airship service between Germany and Sweden has been proposed, and a site for an airship station selected near Stockholm.

In Norway an official Air Traffic Commission has various schemes for air postal services from Christiania to Copenhagen, and the Norske Luftfartrederei, a private company, has prepared plans for opening a number of routes, including that between Bergen and Stavanger.

The Storting, on March 16th, 1920, dealt with a recommendation from the Communication Committee regarding a State contribution to an air traffic route.

The sum of 300,000 kroner (16,000*l.**) requested by the "Norske Luftrederei" in aid of an experimental service extending over a period of four months has been reduced by the Committee to 60,000 kroner (3,800*l.*).

During the last six months, the market for British aircraft in Scandinavia has become more favourable owing to the inferiority of machines supplied from Germany.

FRANCE.—The transference by the Decree of January 30th, 1920, of the "Organe de Co-ordination Général de l'Aeronautique" and the departments dependent upon it from the Ministry of War to the Ministry of Public Works and the appointment of an Under Secretary of State for Air mark a fresh step towards the establishment of aviation on an independent basis. The Under Secretary of State is now responsible for the Air Navigation, Technical, Aircraft Production, and Meteorological Departments, and has created an Advisory Committee for Aeronautics to study problems connected with aviation. A Technical Consultative Committee has also been appointed to the Aeronautical Technical Department.

The French have promoted their interests abroad by increasing their representatives and by establishing a number of missions in foreign countries. In addition to an Air Attaché at London, Assistant Military Attachés, with the special duty of studying aviation, have been appointed to Washington, Stockholm, Brussels, Rome and Amsterdam. Official aviation missions have been sent to Argentina, Brazil, Japan, Peru, Poland, Finland, Serbia, Czecho-Slovakia and Turkey.

Consequent upon a reduction in the total French air estimate for the current year, there has been a re-grouping of the sums to be expended on civil aviation, with the result that whilst the subsidies to be given to air transport companies will be augmented, large economies will be effected in the purchase of service aerodromes and hangars.

In conformity with the above policy, a new scheme of subsidies has been drawn up, based upon the value of the machine and engine and the number of hours flown. Other salient points are: a bonus to the crew, a premium on useful load and speed, and the additional grant of 25 per cent. for machines of military value.

In addition to the Government subsidy, companies conducting an air mail service receive from the Postal Administration 8 francs for the first 100 grammes, and 1.60 francs for every additional 20 grammes of letters or parcels.

The State has acquired five aerodromes and 24 landing grounds for the use of civil aircraft, and these are placed under the Service de la Navigation Aerienne, which has issued provisional regulations regarding their use. Three aerodromes and six landing grounds have been opened and the remainder are being equipped. Le Bourget and St. Inglevert have been approved as customs aerodromes, and aerial lighthouses have been erected at St. Inglevert and Lille. In addition 13 military aerodromes may be used by civil aircraft belonging to the nations which have signed the Air Convention.

The Decree of October 24th, 1919, defining the conditions under which French civil pilots may use military landing grounds, has been modified to apply to foreign civil pilots whether they belong to air transport companies or not.

As in Great Britain, the problem of instituting an insurance scheme for air transport is at present under consideration, the Consortium des Assurances Aeriennes having drawn up a list of tariffs applicable to public and private insurance companies.

Since September 1919, an aerial service between Toulouse and Rabat has been operated by the Compagnie de Navigation Aerienne (M. G. Latecoere) which has obtained a concession from the Spanish Government. The route passes over Spain with stops at Barcelona, Alicante and Malaga. Flights are made twice weekly in each direction. Mails and passengers are conveyed between France and Morocco

* Where the English equivalent of foreign money is given in this report, it is estimated approximately at the rate of exchange prevailing in April 1920.

and by a special arrangement Spanish mails are carried between the intermediate stopping places. The concession granted to the French Company is provisional and does not exclude or limit similar grants to others.

Another French company, the Société Anonyme des Transportes Aeronautiques du Sud-Ouest has been reconstituted under the title of Compania Franco-Bilbania des Transportes Aeronauticos, for the purpose of forming a Franco-Spanish company to open a service between Bayonne, San Sebastian, Bilbao and Santander, by which it is hoped to carry mails from Bilbao to connect with the Paris express at Bayonne, and, in the case of English mails, secure delivery in London on the following day by arrangement with the Paris–London air service. The company would be registered in France in order to retain the right to the French air transport subsidies.

A regular service between Nîmes and Nice is conducted by the Compagnie Aerienne Francaise, a flight being carried out in both directions bi-weekly. The company is subsidised under the Government scheme.

The "Aero-Navale" Company has under consideration the establishment of a seaplane service between Marseilles and Algiers, with an intermediary landing on the Balearic Isles (Spanish).

At Pierrefeu, in the neighbourhood of Marseilles, there is a large rigid airship shed which is conveniently placed for international civil traffic by airships.

The policy of carrying out long distance flights in order to connect France with her colonial possessions by air is still being actively pursued, and a successful flight has been made across the Sahara from Algiers *viâ* Timbuktu to Dakar.

GERMANY.—The organisation of civil aviation has been steadily progressing during the last six months, but actual flying has been partially suspended owing to the shortage of petrol and the disturbed condition of the country.

Germany now possesses a Ministry of Air and Transport. The Department for Air supervises general questions concerning air traffic, air regulations, aerodromes, aerial photography, the distribution of material, the classification and testing of types, inventions, meteorology and intelligence, wireless telegraphy, and the control of aerial organisations.

The German Government have also established a strict control over the movements of all aircraft. At the beginning and end of each flight proof has to be given of the purpose of the journey. The pilot is obliged to hold a pilot's certificate issued by the State Air Department and, except in the case of flights carried out by air transport companies, a permit issued by the police authorities for each flight. Air transport companies, it is understood, are allowed to issue permits for flights under an arrangement with the State Air Department, to which they are responsible. All luggage carried by aircraft is subject to special inspection.

A number of new transport companies have been formed, and at present there are 25 such companies in existence. All these companies are as yet undeveloped, and the activities of the two principal organisations—the Deutsche Luftreederei and the Sablatnig—are at present very slight. Although the list of companies and firms engaged in civil aviation is at first sight imposing, it represents little of real account, in spite of the big press campaign conducted to demonstrate the existence and importance of German civil aviation. The present object of the companies is to interest the public in aerial transport and to keep going until the commercial aeroplane is a practicable proposition.

Germany has not yet produced a commercial aeroplane suitable for civil aviation, but many German engineers are working to discover a satisfactory type.

The Government Department for Air and Power Transport (Reichsamt für Luft und Kraftfahrwesen) has in the Supplement to the Home Allowance of the State Transport Ministry for the year 1919 allotted the sum of 500,000 marks (2,300*l.*) as a subsidy for German aviation enterprise. The granting of the subsidy is conditional on the maintenance of air communication and of an air post. In the Home Office grant for 1920 12,000,000 marks (55,800*l.*) are to be devoted to the same purpose.

Germany is undoubtedly looking to airships to play a prominent part in her schemes for the future, and it is understood that the Germans hold the same views as ourselves as to the ultimate rôle of airships, namely, to carry out long distance trans-oceanic and trans-continental non-stop tours.

The airship "Bodensee" has been increased by 10 metres in length, and a new airship, "Nordstern," similar to the unmodified "Bodensee," has been completed.

It is believed that the airship company using the present Friedrichshafen–Staaken route, on which the "Bodensee" successfully operated for three to four

months last year, is to extend this route to the principal Scandinavian towns. This company has not carried out any flights since the end of November 1919.

HOLLAND.—Responsibility for civil aviation rests at present with the Minister for Waterways and Roads. A Dutch Air Attaché has been appointed to Paris.

As a means of awakening public interest in aviation in Holland and her Colonies, the Government has organised a long-distance flight from Holland to Java. It is defraying the expenses of the competitors, and subscribing 10,000 florins (900*l.*) towards the prize.

The advantageous position of Holland as a junction for aircraft bound to Scandinavian countries is recognised and subscriptions are being raised at several important industrial towns for the establishment of local civil aerodromes.

It is also believed that the Government has given, or contemplates giving, a grant to the municipal authorities of Amsterdam and Rotterdam for the construction of international aerodromes.

The whole matter of opening up aerodromes for civil aviation in Holland is under consideration by the four Ministries (Navy, War, Waterways, and Finance), but no definite decision has been reached. It is expected that Schiphol will soon be used as a starting point and landing ground for commercial machines.

A company, known as the Royal Air Transport Company for the Netherlands and Colonies, has been founded with the support of important commercial interests. This is a private company which has been granted the title of Royal by the Queen.

The Netherlands East Indian Government has decided, for purposes of meteorological, climatic, and other observations, to execute a daily flight between Batavia and Surabaya. This will be carried out during four, not necessarily consecutive, months of the year, and seaplanes and aeroplanes will be employed alternatively.

HUNGARY.—A Department for the administration of civil aviation has been formed under the Minister of Commerce, who is employing demobilised officers to assist in this work. This Department is drafting regulations governing air navigation.

It is reported that an aerial transport company, known as the "Ungarische Aero-Verkehrs Aktiengesellschaft," has been formed, with a capital of 50,000,000 kr. (67,000*l.*), for the purpose of establishing aircraft services. As in the case of Austria, the present industrial and economic state of the country is unfavourable to the development of civil aviation.

ITALY.—The General Directorate of Aviation under the Minister of Transport, constituted by a Royal Decree of June 30th 1919, is still responsible for the administration of civil aviation, and controls the Technical, Supply and Experimental Departments of military aviation and training schools. It is, however, reported that the appointment of an Under-Secretary of State for Air is contemplated. A Royal Decree for the regulation of air navigation came into force on January 3rd, 1920.

The Government is sparing no pains to promote Italian interests abroad, and it is understood that 16 Air Attachés have been appointed to various countries. In addition to the countries enumerated in the last report, missions have been despatched to Japan, Peru, Poland, Serbia, Czecho-Slovakia, Finland, Indo-China, and Turkey. As an example of the expenditure incurred by these missions, it is interesting to learn that the initial cost of the mission to Argentina was 6,000,000 lire (66,000*l.*), in addition to 350,000 lire (3,900*l.*) a month for running expenses.

Italy has also realised the importance of securing a market in the East, and for this purpose a demonstration flight is now being undertaken from Rome to Tokio. In connection with this flight a number of machines have been sent to China and are being exhibited at Shanghai.

The following internal air routes are projected or in course of organisation by the State, which will bear the cost of their maintenance until the development of civil enterprise permits of their being conceded to private companies :—

(1) Northern Italy. Turin–Trieste, with branches northwards to Bressanone and southwards to Bologna.
(2) Western Italy. Nice–Sicily *viâ* Genoa, Pisa, Rome and Naples, with a branch line from Rome to Sardinia.
(3) Eastern Italy. Bologna–Brindisi–Otranto.
(4) Connecting routes. Rome–Ancona, Naples–Foggia, Milan–Genoa, &c.

A number of former service aerodromes have already been opened for civil aviation.

A passenger and postal air service between Italy and Greece is being operated as an experiment by the Italian Government. A flight is made in both directions twice a week. Air postal flights have also been carried out by the Italians between Athens and Candia (Crete).

With a view to advertising Italian machines a demonstration flight employing six F.B.A. seaplanes is expected shortly to leave Naples for Sweden. The route to be followed is :—Naples–Leghorn–St. Raphael–Geneva–Bâle–Cologne–Amsterdam–Esbjerg–Stockholm.

The development of air communication in the Italian Colonies is also receiving attention. A service between Italian Eritrea and Somaliland is being organised, while the possible use of air transport in Tripoli and the Libyan Provinces is under consideration.

A feature of State aid is the proposed institution of civil aviation schools and University courses at Rome and Turin.

As an indication of the methods by which the Italian Government proposes to assist private enterprise, it may be mentioned that a Sardinian company is reported to have obtained a concession for running a service between Rome and Sardinia which includes a subsidy of 660,000 lire (7,300*l.*) and the free use of aviation material in Sardinia to the value of 15,000,000 lire (166,700*l.*).

A new semi-rigid airship, T 34, is now undergoing trials.

SPAIN.—Since the last Report, there is evidence that keener interest is being taken in civil aviation. A Royal Decree was signed on November 25th, 1919, determining the conditions under which aircraft may fly over and land on Spanish national territory, with an annex for the general regulation of civil air navigation.

A further annex, dated December 13th, 1919, contains regulations for Spanish air customs.

Later in December, by a Decree of the Minister of Public Works, a Department for Aerostatics and Civil Aviation was established under the Directorate of Commerce.

A Committee, constituted earlier in the year under the President of the Ministerial Council for the consideration of aviation matters, will now form a consultative body for the new Department of Aviation.

The Ministry of Finance, under Royal Order, has fixed the rates to be paid for correspondence sent by air mail. Until special stamps are brought into use mail matter will be franked with the ordinary stamps surcharged according to the rate for the aerial post. All ordinary letters and money orders can be sent by aerial post up to a weight limit of 500 grammes. Registered and insured letters and parcels are not carried and the Post Office accepts no responsibility for loss or damage.

The technical inspection of air postal services will be conducted according to the regulations fixed for civil aviation, and an inspector for this duty will be appointed by the Director-General of Posts and Telegraphs.

Private local enterprise is still in the preparatory stage, the principal activity being displayed by the French. The Toulouse–Rabat line, which passes over Spain, now appears to be organised on a firm basis, and the contract for the operation of an air mail service between Madrid and Barcelona foreshadowed in the last report is stated to have been obtained by a French firm. The air mail service between Barcelona and the Balearic Isles has been organised by an association of Mediterranean shipbuilders. It was inaugurated on March 18th, 1920, and a preliminary flight has already been made. Italian seaplanes are to be used.

A postal service between Barcelona, Alicante and Malaga has been authorised by the Director-General of Posts and Telegraphs, and inaugurated by the French Latecoere Company. (*Vide also under* France.)

It is reported that a new aerial service for passengers and mails is to be opened between Bilbao, Biarritz and Bayonne. A French firm is interested in this project, and both the Spanish and French parties are to be equal in number. (*Vide also under* France.)

SWITZERLAND.—Steps have been taken to dissociate the control of military and civil aviation, by transferring the latter from the Minister of War to the Minister of Posts and Railways, under whose administration a Bureau of Civil Air Navigation was opened on April 1st. This step has been hastened by the opening of air traffic

with England and France as a result of the temporary agreements with those countries, which came into force on March 1st. In the first instance the Bureau will be provided with a small staff only and its duties will apparently be of a limited and tenative nature. A small sum has been placed at its disposal. Among its functions will probably be the supervision of examinations for pilots carried out by the Swiss Aero Club and the encouragement of research.

On January 27th, 1920, the Government published Air Navigation Regulations governing flight over Swiss territory.

Appointed customs aerodromes have been opened for international flying at La Blecherette (Lausanne) and Dubendorf (near Zurich).

A number of Swiss companies are devoting themselves to giving passenger flights over the Swiss lakes and over Alpine scenery, and are interesting themselves in the establishment of regular air services.

The Swiss "National Aviatik" Company of Dubendorf has taken over from the Government the air service which formerly carried mails between Dubendorf, Berne, Lausanne and Geneva. Three other routes have been studied by this company, viz. :—

Lausanne–Yverdon–Neuchâtel Lake–Aar Valley–Bâle.
Zurich–St. Moritz, *viâ* Grisons Canton.
Zurich–Lugano, *viâ* Lucomagno.

The Ad Astra Schweizerische Luftverkehrsgesellschaft (Swiss Air Traffic Co.), Zurich, has carried out a large number of passenger flights at Locarno and Zurich. It is reported that the company contemplates next year the operation of an aerial service between Geneva and Friedrichshafen to connect the French line Marseilles–Geneva with the German airship line Friedrichshafen–Berlin–Stockholm.

The "Société Aero," Zurich (Comte, Mittelholzer & Co.), has, according to a report now amalgamated with the "Ad Astra" company. Formerly it undertook passenger flights and the manufacture of photographs and films taken above the Alps.

The Avion Tourisme S.A. (Aeroplane Touring Co., Ltd.), Geneva, has hydro-aeroplane bases at Lugano and Locarno, from which passenger trips are made round the lakes.

Asia.

China.—Foreign countries are continuing their endeavours to open up Chinese markets for their products, and in view of the predominant position which the French hold in the Chinese Postal Administration, it is not unlikely that they will make a strong bid for the privilege of inaugurating an air postal service.

Italy is also making an effort to secure a footing, and a report was received towards the end of January 1920 that a shipment of Italian aeroplanes had arrived at Shanghai, where the machines were on view. (*Vide also under* "Italy.")

The Anglo-American Tobacco Company is reported to have decided to use aeroplanes to carry their men and medical supplies into the interior.

An American company is reported to have shipped in January seaplanes to Hong Kong for operating commercially on the coast of China and adjacent waters.

Japan.—During the last six months aviation has made little progress. There are signs, however, that the necessity for an efficient air service is recognised.

A special committee has been appointed to deal with civil aviation, and it is expected that as a result of its deliberations, a permanent Aviation Board composed of eight representatives from the Army, four from the Navy and fourteen from the Civil Service will be established.

The President of the Japanese Imperial Aviation Association, General Nagaoka, who is touring through Europe and America, arrived in England towards the end of March, in order to make a thorough investigation of civil aviation in this country,

Two companies have been formed with the object of inaugurating air services.

Siam.—A Royal Decree was published on February 9th, 1920, stating that the King ratified, on February 2nd, the Air Convention of which Siam is a Signatory State. A further Decree of the same date entrusts the Minister of War with the entire direction of all matters concerning air navigation.

In this country the French appear to have established a dominating position in aviation matters.

According to a report of January 1920, an air postal service was about to be established between Bangkok and Uboh by the Siamese Flying Corps.

An Italian Mission arrived in Siam in October of last year.

America.

Cuba.—It is reported that the Cuban Government intends to devote 15,000,000 dollars (3,950,000*l.*) to the purchase of aircraft.

Representatives of the French Farman firm are arranging for services between Cuba and the United States and French pilots are already in the country.

South American States.—Considerable interest in aviation is displayed by all these States. France, Italy, the United States and Great Britain are entering into keen competition to establish markets for their aircraft products.

(i) *Argentina.*—A Decree, authorising the formation of an Aviation Division in the Department of the Ministry of Marine, was signed on October 17th, 1919, and 250,000 pesos are earmarked in the 1920 Budget for the purchase of war material.

There exist at present three Air Transport Companies:—(*a*) The Compania Franco Argentina des Transportes Aereos, among the objects of which is to represent the French aviation industry in Argentina; (*b*) the Compania Argentina des Transportes Aereos, which is closely associated with the firm of Saenz Mai & Co. (these two companies owe their origin largely to the acquisition of the surplus stock of the French and Italian Missions that arrived in October and March 1919 respectively); (*c*) the Sociedad Rio Platense de Aviacion.

A new mission from Italy (the second) arrived at Buenos Aires on March 29th. This mission was sent by the Italian Ansaldo company, and is composed of a number of pilots and mechanics, to be followed by some machines.

The United States are represented by the Curtiss Aeroplane and Motor Corporation. It is reported that this company is engaged in teaching Argentine officers and civilians at Palomar, and it is believed that the Ministry of Marine has purchased a few Curtiss machines.

(ii) *Brazil.*—The French have obtained valuable contracts, partly as a result of the efforts of their mission which was established in the country so far back as October 1918, one of which is to equip and train the Brazilian Air Service.

The Italians have also sent a mission to Brazil, but beyond carrying out propaganda, it does not at present appear to have achieved any definite results.

It is understood that 9 Curtiss aeroplanes have been ordered from the United States.

A prize of 10,000*l.* has been offered for the first successful flight between Lisbon and Rio, and it is believed that the Ministry of Marine has been authorised to spend 10,000*l.* to provide assistance.

(iii) *Chile.*—Several British aircraft firms are endeavouring to obtain concessions to institute commercial air services. A late R.A.F. officer was given charge, in November 1918, of instruction at the military aviation camp. Owing to the success achieved by him this contract was renewed for another year.

A gift of aeroplanes by the British Government was highly appreciated.

(iv) *Colombia.*— Colombia offers exceptional opportunities for the employment of aerial transport, as throughout the greater part of the country the only other means of communication are the River Magdalena and a limited mule service.

On April 11th, 1919, a resolution, signed by the Minister of the Interior, was adopted, calling for public tenders for the transport of mails by air.

The French have already obtained connections in this country, and in accordance with a contract entered into with the local Compania Colombiania de Navegacion Aerea (capital, 160,000*l.*) have undertaken to send out an expert staff of pilots and mechanics to build suitable aerodromes and establish services between various towns.

Another company is reported to have been formed, with French capital, to establish a hydroplane service on the River Magdalena.

(v) *Ecuador.*—Italy has sent a mission to Ecuador and appears to be the first country to have obtained a footing.

In addition to the Italian effort, the Americans are reported to have offered to supply the Army of Ecuador with aeroplanes.

In December information was received that the Government of Ecuador was desirous of obtaining particulars of British aeroplanes for military use.

(vi) *Peru.*—This country is very mountainous and offers very few places in which aeroplanes can land with safety. Seaplanes could be used to advantage, as the coast is practically free from storms during the whole year.

In August information was received that the Peruvian Postmaster had been authorised to ask for tenders from several European and American firms for the establishment of an air route between Tarma and Iquitos for the transportation of mail, passengers and freight.

Several British firms have made proposals to the Peruvian Government.

It is believed that the French Military Mission which arrived in September has been successful in arranging with the Government that it should be consulted on all questions of aviation.

The American Curtiss Company has three machines in the country, and it is believed to be also endeavouring to secure the contract for aerial services.

United States.—The creation of an Air Department has not yet materialised. Senator New's Bill to effect this was discussed by Congress, but after meeting with considerable opposition, based on the expenditure involved, it was returned to the House Committee on Military Affairs for review and amendment.

There is, however, growing recognition of the importance and great possibilities of civil aviation throughout the country, and in view of favourable factors such as long distances, an equable climate and financial prosperity, it is probable that civil aviation in the United States will quickly develop as soon as public confidence has been secured.

A number of States and cities have brought forward independent measures for the regulation of civil air navigation. In this respect it appears that a lack of co-ordination of legislation may result as is the case with the United States motor laws. In the absence of Federal legislation, the United States Air Service has formulated rules of the air as a guide to pilots. A Bill was introduced on February 26th in the State Assembly of New York, to regulate the use of aircraft, and after the first reading the Bill was referred to the Committee of the Judiciary.

Official effort is principally confined to the operation of mail services from New York to Washington and Chicago, for which the Post Office claims a considerable measure of success, and to the forest patrols alluded to in the last report.

A number of air transport companies, such as the North American Aerial Transportation Company, are being formed and aircraft exhibitions have been held.

The only noteworthy achievement overseas has been the inauguration in the Philippines of a daily mail service between Manilla, Fort Mills and Santa Cruz.

An Aerial "Derby" round the world is now in course of organisation, and a special mission, composed of Commandant Beaumont and other prominent men, is touring the different countries for the purpose of making preliminary plans. The mission has already visited Japan, China, Dutch East Indies, and French Indo-China. "The Aerial League of America" is organising an exhibition to be held at Atlantic City from 20th to 30th May.

Conclusion.

The discovery of a new method of increasing the speed of intercommunication has in the past generally indicated a fresh step in the march of civilisation. In aviation a means of transport has been obtained twice as fast as any other previously existing. The majority of countries which are imbued with the spirit of progress appear to realise that the future of aviation cannot be neglected, and by various methods, such as the creation of aviation departments, research, subsidies, and the conduct of experimental services, are striving to adapt aviation to commerce.

In many respects the British Empire is in an unique position. Imperial solidarity can be strengthened by a system of intercommunication by air, and protection is as essential to national security from the air as from the sea. Strong air forces can be guaranteed in time of emergency by a reserve of competent airmen and reliable machines such as the expansion of commercial aviation will ensure. In this expansion the long distances and the undeveloped character of many parts of the Empire are favourable factors.

During the experimental period, however, through which civil aviation is passing some form of State assistance is essential.* In the last half-yearly report three methods were suggested—direct Government subsidies; assistance in the form of grants to approved companies according to mileage and weight carried; the provision of key aerodromes and shed accommodation at home and on the Imperial air routes. Up to the present time the Department of Civil Aviation has only been in the position to act in accordance with the spirit of the last of these suggestions and has been compelled to confine its activity to continuing the work of improving ground organisation. In the present report it has been seen that the work accomplished by the Department includes the planning of air routes, the equipment of aerodromes, the provision of customs facilities for international flying, the improvement of wireless and other means of communication, and the introduction into Parliament of a Bill to meet the requirements of the International Air Convention. In addition, the Department is responsible for the meteorological service of the country in all its branches. By these methods private enterprise has been assisted in organising air services to the Continent which, even in the winter months under review, have been conducted with considerable regularity. Though the distances between London and Paris, and London and Brussels, are not of sufficient length to demonstrate the full value of aircraft in time-saving, yet much experience has been gained and the first step taken in the establishment of a system linking up the United Kingdom with the commercial centres of the Continent.

(Signed) F. H. SYKES,
Controller-General of Civil Aviation.

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* A Report on this subject was presented to the Secretary of State by the Advisory Committee on Civil Aviation on April 19 and was issued as a Command Paper [Cmd. 770] on June 25.

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